

PATENT SPECIFICATION



DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or Relating to Electro-Plating

We, PHILIPS ELECTRICAL INDUSTRIES LIMITED, of Spencer House, South Place, Finsbury, London, E.C.2., a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to electro-plating and particularly to methods of coating by electro-deposition objects having an electrically-conductive surface by means of electrolysis in an electrolyte solution, which is sprayed against the object to be coated, and is discharged by means of a lower outlet of a vessel in which this spraying takes place.

In our prior United Kingdom Specification No. 733,110 we have described a method of the above-mentioned kind wherein the anode is arranged on the base of a vessel, the electrolyte solution being sprayed both towards the object to be coated and towards the anode. It has thus been endeavoured to prevent the anode silt which forms on the anode from moving in the direction of the objects to be coated. However, it has been found that due to turbulence in the electrolyte solution movement of the silt towards the objects to be coated nevertheless takes place and some anode silt is deposited on the objects to be coated.

The object of the invention is to avoid this effect to a greater extent than formerly.

According to the invention, we provide a method of coating by electro-deposition objects having an electrically-conductive surface by means of electrolysis in an electrolyte solution, which is sprayed against the object to be coated and is discharged by means of a lower outlet of a vessel in which the spraying action takes place, wherein the electrolyte solution is first made to leave the vessel via the said lower outlet and then supplied to the anode, which is arranged below said lower outlet and washed by the solution.

We also provide apparatus for carrying out the method according to the invention com-

prising a vessel having a lower outlet in the bottom wall of the vessel, a spraying nozzle for spraying an electrolyte solution against an object to be coated, and an anode, wherein the anode is arranged below the said lower outlet of the vessel and external thereto.

It is thus ensured that the flows of electrolyte via the anode is not directed towards the object to be coated, so that for anode silt or other impurities present do not tend to be deposited on the objects to be coated. The invention is important more particularly for the manufacture of record matrices, since in this manufacture the electro-deposition process has to satisfy very high requirements.

According to a further feature of the invention, the vessel comprises a base having apertures equally distributed over the surface. It is thus ensured that the anode is evenly washed at the upper side, resulting in optimum electrical conductivity between the anode and the cathode being obtained.

In order that the invention may be readily carried into effect, two embodiments will now be described, in detail, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a device for coating objects by electro-deposition in which the anode is arranged in a second vessel, and

Figure 2 shows a similar device in which the vessel bears on the anode.

The device shown in Figure 1 comprises a vessel 1 having an overflow 2 and a base 3. The base 3 is constituted by a sieve, for example of nylon filter cloth. The vessel 1 contains a spraying nozzle 4 to which is supplied an electrolyte solution 6 by means of a pump 5. An object 7 to be coated, which in the figure is a record matrix, is deposited in the vessel 1 and constitutes the cathode in the electrolytic process. A second vessel 8 contains an anode 9 and surrounds the vessel 1 in such manner that an overflow 10 of the second vessel lies at a lower level than the overflow 2 of vessel 1. It is

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thus ensured that a downwardly directed flow always passes through the base 3, so that the silt forming on the anode 9 may be discharged via the overflow 10 and via a lower outlet 11 of the vessel 8, it being possible for the silt to be removed by means of a filter 12 provided in the pump line.

In Figure 2, an anode 20 is supported on a plate 21 which constitutes a trough 22 round the anode 20 and which has an outlet 23. Placed on the anode 20 is a vessel 24 containing a spraying nozzle 25 and a record matrix 26. The vessel 24 has a sieve-like base 27 and an overflow 28 similar to the arrangement shown in Figure 1. An electrolyte solution 29, which leaves the vessel 24 through the base 27, provides for the silt forming on the anode 20 to be discharged through the lower outlet 23.

WHAT WE CLAIM IS:—

1. A method of coating by electro-deposition objects having an electrically-conductive surface by means of electrolysis in an electrolyte solution, which is sprayed against the object to be coated and is discharged by means of a lower outlet of a vessel in which the spraying action takes place, wherein the electrolyte solution is first made to leave the vessel via the said lower outlet and then supplied to the anode, which is arranged below said lower outlet and washed by the solution.

2. Apparatus for carrying out the method claimed in Claim 1 comprising a vessel having a lower outlet in the bottom wall of the vessel,

a spraying nozzle for spraying an electrolyte solution against an object to be coated, and an anode, wherein the anode is arranged below the said lower outlet of the vessel and external thereto.

3. Apparatus as claimed in Claim 2, wherein the lower outlet of the vessel is formed by apertures evenly distributed over the surface of the bottom of the vessel.

4. Apparatus as claimed in Claim 3, wherein the vessel bears with its bottom on the anode.

5. Apparatus as claimed in Claim 3, wherein the anode is placed in a second vessel which surrounds the first vessel in such manner that an overflow of the second vessel lies at a level lower than an overflow of the first vessel.

6. A method of coating by electro-deposition objects as claimed in Claim 1, substantially as herein described.

7. Apparatus as claimed in Claim 2, arranged and operating substantially as described herein with reference to Figure 1 or Figure 2 of the accompanying drawings.

8. An object when coated by electro-deposition by the method claimed in Claim 1 or 6.

9. A record matrix when produced with the aid of the electro-deposition method claimed in Claim 1 or 6.

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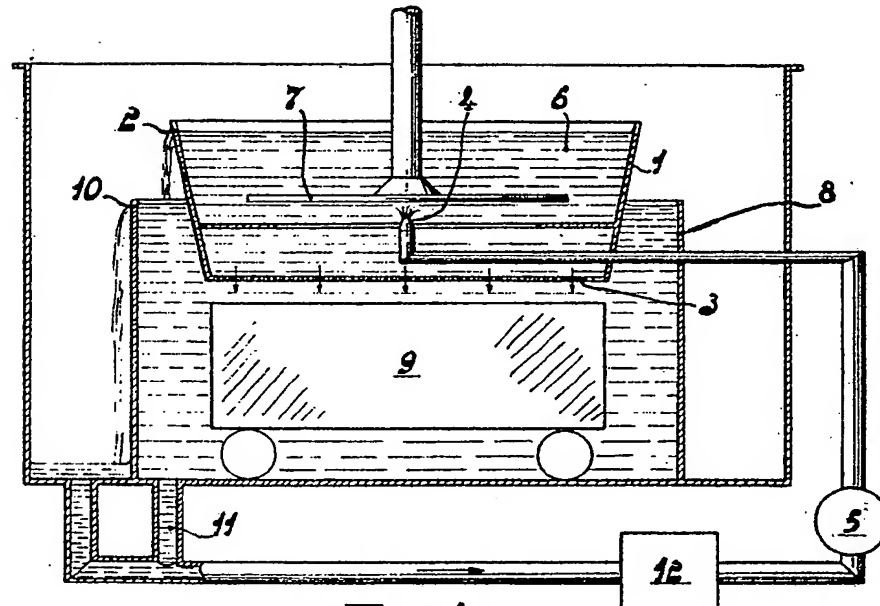


Fig. 1

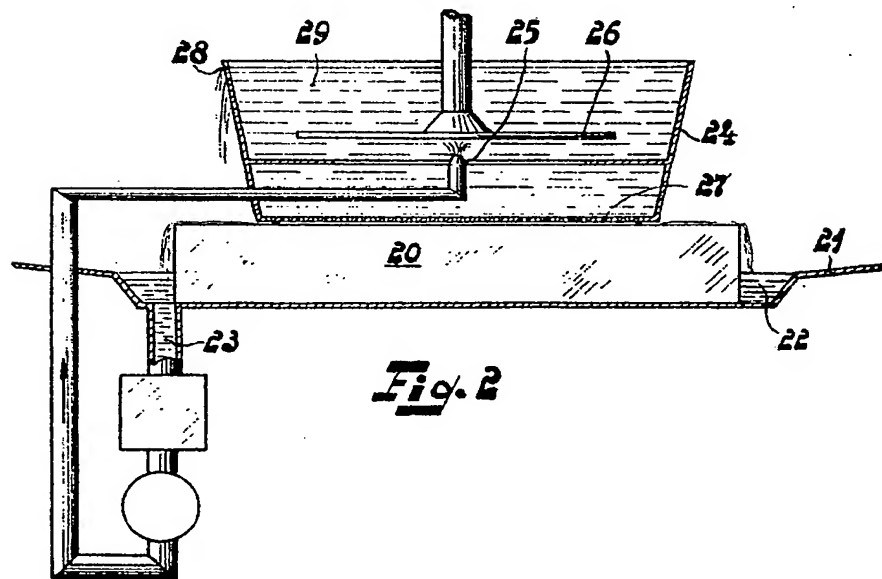


Fig. 2

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